WHAT IS CLAIMED IS:

1. A waveguide type optical element comprising:

a light absorption layer formed on a compound semiconductor substrate;

a ridge part made at a predetermined area on said light absorption layer; and

an impurity diffusion area made on an electro absorption layer under said ridge part.

2. A waveguide type optical element as claimed in claim 1, wherein in a case of oscillation with long wavelength, a clad layer and said compound semiconductor substrate which constitute said ridge part are formed of InP.

3. A waveguide type optical element as claimed in claim 1, wherein in a case of oscillation with short wavelength, a clad layer and said compound semiconductor substrate which constitute said ridge are formed of GaAs.

4. A waveguide type optical element as claimed in claim 1, wherein said impurity diffusion area is made by Zinc diffusion.

5. A waveguide type optical element as claimed in claim 1, wherein an insulation layer is formed on said light absorption layer at side of said ridge part.

6. A waveguide type optical element as claimed in claim 5, wherein said insulation layer comprises a polyimide layer.

7. A waveguide type optical element as claimed in claim 1, wherein said ridge part comprises said clad layer and a contact layer.

8. An integrated optical waveguide type element integrating said waveguide type optical element as claimed in any of claims 1 to 7 into an optical amplifier or an optical modulator.

9. A method of manufacturing a waveguide type optical element comprising steps of:

forming a light absorption layer on a compound semiconductor substrate,

forming a compound semiconductor layer on said light absorption layer, and

selectively etching said compound semiconductor layer for forming a ridge part,

wherein impurity included in said compound semiconductor layer is selectively diffused on said light absorption layer.

10. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein said a selectively impurity diffusion step is a step to form an undope compound semiconductor layer on said light absorption layer and to selectively diffuse impurity on said light absorption layer while diffusion of impurity from said compound semiconductor layer is suppressed by said undope compound semiconductor layer.

11. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein said undope compound semiconductor layer is formed on said light absorption layer, which locates at both ends at an area to be made into said ridge part.

12. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein impurity is Zinc.

13. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein in a case of oscillation with long wavelength, said compound semiconductor layer, said undope compound semicondutor layer, and said compound semiconductor substrate are formed of InP.

14. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein in a case of oscillation with short wavelength, said compound semiconductor layer, said undope compound semicondutor layer, and said compound semiconductor substrate are formed of GaAs.

15. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein said undope compound semiconductor layer uses a selectivity growth technique.

16. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein an InGaAsP layer is grown on said undope compound semiconductor layer as an etching stop layer.

17. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein an insulation layer is formed on said light absorption layer at said side of said ridge part.

18. A method of manufacturing a waveguide type optical element as claimed in claim 9, wherein said compound semiconductor layer functions as a clad layer and a contact layer is formed on said clad layer.

19. A method of manufacturing an integrated optical waveguide type element integrating said waveguide type optical element as claimed in any of claims 9 to 18 into an optical amplifier or an optical modulator.